# CELL, MOLECULAR AND DEVELOPMENTAL BIOLOGY

(for students entering Biology in Fall 2011 or later)

**Graduation Requirements:**
- A minimum 2.0 average in all biology courses required for this major
- A minimum of 32 credits at or above the 300-level completed at a Purdue campus
- At least one 500-level Biology course other than BIOL 54200
- 124 Total Credits

**BIOLOGY:**

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 13500 First Year Biology Lab (2 cr.; both) or BIOL 19500 CASPIE Laboratory (2 cr., both)
4. BIOL 23100 Biology III: Cell Structure and Function (3 cr.; fall)
5. BIOL 23200 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
6. BIOL 24100 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
7. BIOL 24200 Laboratory in Genetics and Molecular Biology (2 cr.; spring)
8. BIOL 28600 Intro. to Ecology and Evolution (2 cr.; spring) or BIOL 29500, Intro. to Evolution & Ecology (2 cr.; fall)
9. Intermediate Requirement: Choose one of these four options:
   - **A.** BIOL 32800 Principles of Physiology (4 cr.; spring)
   - **B.** BIOL 36600 Principles of Development (4 cr.; spring)
   - **C.** BIOL 39500 Macromolecules (3 cr.; fall)
   - **D.** BIOL 43800 General Microbiology (3 cr.; fall) and BIOL 43900 Microbiology Lab (2 cr.; fall)
10. Two of these three courses:
    - A. BIOL 41500 Intro. to Molecular Biology (3 cr.; fall)
    - B. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
    - C. BIOL 48100 Eukaryotic Genetics (3 cr.; spring)
11. BCHM 56100 General Biochemistry I (3 cr.; fall) or CHM 53300 Introductory Biochemistry (3 cr.; fall)
12. BIOL 44201 Introductory Module: Protein Expression plus two additional modules of BIOL 442xx' (1-2 cr.; both) (various titles) or BIOL 54200' (1 cr.; both) Neurophysiology (1 cr.; fall)
13. One of these five courses:
    - A. BIOL 51600 Molecular Biology of Cancer (3 cr.; spring)
    - B. BIOL 55000 Plant Molecular Biology (3 cr.; spring)
    - C. BIOL 57300 Molecular Biology of Animal Cells (3 cr.; fall)
    - D. BIOL 59500 Cellular Biology of Plants (3 cr.; fall)
    - E. BIOL 59500 Developmental Biology (3 cr.; spring)
14. Biology Electives: Six credits of the following:
   - BIOL 39500 Macromolecules (3 cr.; fall)
   - BIOL 41500 Intro. to Molecular Biology (3 cr.; fall)
   - BIOL 41600 Viruses and Viral Diseases (3 cr.; spring)
   - BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
   - BIOL 43200 Reproductive Physiology (3 cr.; alternate fall)
   - BIOL 43600 Neurobiology (3 cr.; fall)
   - BIOL 43800 General Microbiology (3 cr.; fall)
   - BIOL 43900 Microbiology Lab (2 cr.; fall)
   - BIOL 44400 Human Genetics (3 cr.; fall)
   - BIOL 44600 Cellular Microbiology (3 cr.; spring)
   - BIOL 47800 Intro to Bioinformatics (3 cr.; fall)
   - BIOL 48100 Eukaryotic Genetics (3 cr.; spring)
   - BIOL 48300 Environmental & Conservation Biology (3 cr.; spring)
   - BIOL 49300 Intro. to Ethology (3 cr.; fall)
   - BIOL 49500 Biological & Structural Aspects of Drug Design & Action (3 cr.; spring)
   - BIOL 51100 Intro. to X-Ray Crystallography (3 cr.; spring)
   - BIOL 51600 Molecular Biology of Cancer (3 cr.; spring)
   - BIOL 51700 Molecular Biology: Proteins (2 cr.; spring)
   - BIOL 52900 Bacterial Physiology (3 cr.; spring)
   - BIOL 53300 Medical Microbiology (3 cr.; fall)
   - BIOL 53700 Immunology (3 cr.; spring)
   - BIOL 53800 Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)
   - BIOL 54100 Molecular Genetics of Bacteria (3 cr.; fall)
   - BIOL 54900 Microbial Ecology (2 cr.; alternate spring)
   - BIOL 55000 Plant Molecular Biology (3 cr.; spring)
   - BIOL 55900 Endocrinology (3 cr.; fall)
   - BIOL 56200 Neural Systems (3 cr.; spring)
   - BIOL 57300 Molecular Biology of Animal Cells (3 cr.; fall)
   - BIOL 57300 Molecular Biology of Animal Cells (3 cr.; fall)
   - BIOL 58000 Evolution (3 cr.; spring)
   - BIOL 58500 Ecology (3 cr.; fall)
   - BIOL 58705 Animal Communication (3 cr.; alternate fall)
   - BIOL 59100 Field Ecology (4 cr.; alternate fall)
   - BIOL 59200 Evolution of Behavior (3 cr.; spring)
   - BIOL 59500 Cellular Biology of Plants (3 cr.; fall)
   - BIOL 59500 Developmental Biology (3 cr.; spring)
   - BIOL 59500 Developmental Biology (3 cr.; spring)
   - BIOL 59500 Ecological Statistics (3 cr.; fall)
   - BIOL 59500 Methods & Measurement in Physical Biochemistry (3 cr.; fall)
   - BIOL 59500 Protein Bioinformatics (2 cr.; spring)
   - BIOL 59500 Sensory Ecology (3 cr.; alternate spring)
   - BIOL 59700 Sex and Evolution (3 cr.; alternate fall)
   - BCHM 56200 General Biochemistry II (3 cr.; spring)

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*Three credits of undergraduate research, approved by the Undergraduate Studies Committee, may be used to replace some or all of the lab modules.

*Other requirements are on the back of this page.
CHEMISTRY
1. CHM 11500 General Chemistry (4 cr.; both)
2. CHM 11600 General Chemistry (4 cr.; both)
3. One of these three options:
   a. CHM 25500 Organic Chemistry (3 cr.; both) and CHM 25501 Organic Chemistry Lab (1 cr.; both) and
      CHM 25600 Organic Chemistry (3 cr.; both) and CHM 25601 Organic Chemistry Lab (1 cr.; both)
   b. CHM 26505 Organic Chemistry (3 cr.; fall) and CHM 26300 Organic Chemistry Lab (1 cr.; fall) and
      CHM 26605 Organic Chemistry (3 cr.; spring) and CHM 26400 Organic Chemistry Lab (1 cr.; spring)
   c. CHM 25700 Organic Chemistry (4 cr.; both) and CHM 25701 Organic Chemistry Lab (1 cr.; both) and one of:
      CHM 33300 Principles of Biochemistry (3 cr.; both) or BCHM 30700 Biochemistry (3 cr.; both)

PHYSICS
One of these two options:
1. PHYS 22000 General Physics (4 cr.; both) and PHYS 22100 General Physics (4 cr.; both)
2. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
   A. PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
   B. PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 25200 Electricity and Optics Laboratory (1 cr.;
      spring)

COLLEGE OF SCIENCE CORE REQUIREMENTS
Composition and Presentation; Teambuilding and Collaboration; Language and Culture; Great Issues; General Education;
Multidisciplinary Experience; Mathematics; Statistics; Computing (see handout).

FREE ELECTIVES
Approximately 0 - 19 credits